2019

Washington State Ferry Terminal
Structural Inspection

By the Bridge Preservation Office

Kingston Ferry Terminal

Location	Bridge No.	Type	Inspection Date	Report Received
Slip 1	104/12FT	Routine & FC	9/10/2019	11/18/2019

FC= Fracture Critical

Washington State Department of Transportation

Electronic Version **G:\Term_Fac_Info\(Terminal)\Inspections\Bridge_Reports*.pdf**
Also on the DOT Bridge website at http://beist/InventoryAndRepair/Inventory/BRIDGE
Additional Information and Fracture Critical Report are in the Bridge Works Program

BRIDGE INSPECTION REPORT

Status: Released | Printed On: 11/13/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

Inspector's Signature CRT Cert # G1325 Cert Exp Date 1/12/2022

David R Brune for MDM

Co-Inspector's Signature MDM

Inspections Performed

Report Type	Inspection Type	Date	Freq	Hours	Inspector	Cert No	Co-Insp.
Routine		**9/10/2019**	**24**	**1.0**	**CRT**	**G1325**	**MDM**
Fracture Critical		**9/10/2019**	**24**	**1.0**	**CRT**	**G1325**	**MDM**
Underwater		10/11/2017	60	7.0	RMP	G1215	JRWH
Special Feature	**Ferry terminal**	**9/10/2019**	**24**	**1.0**	**CRT**	**G1325**	**MDM**
UW Interim			30				

8		Alignment	(1661)	47		Operating Tons	(1552)	N		Bridge Rails	(1684)	0		No Utilities	(2675)
7		Deck Overall	(1663)			Op RF	(1553)	N		Transition	(1685)	2.00		Asphalt Depth	(2610)
7		Superstructure	(1671)	28		Inventory Tons	(1555)	N		Guardrails	(1686)	1986		Year Built	(1332)
7		Substructure	(1676)			Inv RF	(1556)	N		Terminals	(1687)	2001		Year Rebuilt	(1336)
9		Culvert	(1678)	5		Operating Level	(1660)			Bridge Rail Ht	(2612)				
8		Chan/Protection	(1677)	A		Open/Closed	(1293)			Design Curb Ht	(2611)				
2		Pier/Abut/Prot	(1679)	6		Structural Eval	(1657)								
8		Waterway	(1662)	8		Deck Geometry	(1658)								
3		Scour	(1680)	9		Underclearance	(1659)								

RECEIVED
NOV 18 2019
TERMINAL ENGINEERING

NBIS Risk Category
High Risk

Inspection Flags

Soundings (2693)	Measure Clearance (2694)	Revise Rating (2688)	Photos (2691)	QA Flag (2695)

BMS Elements

Element	Element Description	Total	Units	CS 1	CS 2	CS 3	CS 4
8125	Concrete Submerged Pile/Column	7	EA	7	0	0	0
8128	Steel Submerged Pile/Column	20	EA	20	0	0	0
8130	Steel Pier Cap/Crossbeam	255	LF	255	0	0	0
8132	Concrete Pier Cap/Crossbeam	30	LF	30	0	0	0
8201	Steel Open Girder, (FC)	180	LF	176	0	4	0
8206	Steel Floor Beam	240	LF	234	0	6	0
8209	Steel Stringer	450	LF	440	0	10	0
8219	Steel Grid Deck Concrete Filled	1,800	SF	1,800	0	0	0
8224	Thin Polymer Overlay < 0.5" Thick	2,100	SF	2,089	0	11	0
8225	Non-skid Metal Surfacing	315	SF	305	5	5	0
8301	Apron Steel Orthotropic Deck	315	SF	315	0	0	0
8305	Apron Hinge Multi-Pin & Plate	4	EA	2	0	2	0
8307	Apron Lips & Pins	7	EA	7	0	0	0

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BMS Elements (Continued)

Element	Element Description	Total	Units	CS 1	CS 2	CS 3	CS 4
8312	Span Apron/Cab Gangplank Pivot/Raise/Rams/Fittings	2	EA	2	0	0	0
8341	Lift Beam (FC)	34	LF	34	0	0	0
8342	Live Load Hanger Bars (FC)	2	EA	2	0	0	0
8343	Apron Two Hinge Pin System/LL Hanger Pins (FC)	4	EA	4	0	0	0
8348	Span Hoist/Cables/Spool/Platform/Supports/Rigging	1	EA	1	0	0	0
8361	Scour	2	EA	1	1	0	0
8390	Fixed Bearing	2	EA	2	0	0	0
8408	Steel Sliding Plate Joint	24	LF	24	0	0	0
8413	Steel Tower/Steel A Frame	2	EA	1	1	0	0
8415	Steel Headframe	160	LF	160	0	0	0
8417	Tower Base Platform	92	SF	92	0	0	0
8418	Counterweight Guides	2	EA	2	0	0	0
8419	Concrete Counterweights	2	EA	2	0	0	0
8420	CTWT Sheaves/Shafts(FC)/Bearings/Anchor Blts.	10	EA	10	0	0	0
8421	Counterweight Cable Protective Systems	288	LF	288	0	0	0
8451	Steel Pile Frame Wingwalls	60	LF	60	0	0	0
8462	Steel Pile Frame Dolphins	5	EA	5	0	0	0
8463	Timber Floating Dolphin	65	LF	0	0	0	65
8810	Metal Bridge Railing	29	LF	29	0	0	0
8901	Protective Coating - Bridge	10,000	SF	7,300	2,600	100	0
8902	Protective Coating - Piling	43,380	SF	43,037	0	343	0
8907	Galvanizing	100	SF	100	0	0	0
8910	Safety Access Ladders	7	EA	6	1	0	0
8911	Safety Railing & Catwalks	98	LF	98	0	0	0

Notes

0 GENERAL NOTES:
For location reference: AHEAD on stationing is going OFFSHORE and lateral features are called out LEFT and RIGHT.
Slip 1 starts at the bridge seat and goes offshore. See attached layout.
BPO Routine inspectors perform a cursory safety inspection of offshore structures. Repairs and detailed inspection of offshore dolphins are managed by WSF.
BPO Underwater inspectors perform a full inspection of offshore structures below water which includes the writing of repairs.

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Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

Notes (Continued)

1 FRACTURE CRITICAL INSPECTION:
Fracture Critical (FC) Inspection includes visual inspection of the tension zones of the transfer span two girder system, visual inspection of the liftbeam, visual inspection of lower pins and ultrasonic testing of the upper live load hanger pins on a 72 month frequency.

Lower live load hanger pins are hydraulically operated and are above deck level. These lower pins are hollow hydraulic cylinders and ultrasonic test results are inconclusive. The exposed outer areas of the pin barrels were examined for surface flaws and no flaws were noted (Photo #121). The live load hanger bars have a tension link between the lift beam and the hydraulic lower pins. The tension link is connected to the lift beam double shear plates with two 2" diameter X 7" long pins on each end of the lift beam. This area of the lift beam is rusty (Photo #122). REPAIR #10018. See attached FC Report for details.

9 An underwater inspection of the Kingston (Aux.-Slip 1) was conducted by the WSDOT Dive Team October 11th, 2017 with a supplemental inspection of the bridge seat on December 18, 2017. This inspection encompassed all submerged portions of the auxiliary slip including bridge seat piles, tower piles, wingwalls piles, offshore dolphin piles, floating timber dolphin pontoons, anchor chains, and anchors. See layout sheets and pile data spreadsheet for specific details.

With the exception of the timber floating dolphin, most inspected elements were found to be in good condition with only minor defects noted. The timber floating dolphin slip side anchor chains have overall corrosion with up to 75% section loss. The timber dolphin is listing approximately 1.5 ft. Two of the timber dolphin's pontoons have gaping holes with exposed deteriorating flotation material.

The recent scour repair addressed the severely eroded clay substrate at the bridge seat where four 30 in. uncoated steel piles have been added to the bridge seat frame. The erodible clay continues to degrade, but overall scour depth remains about 20 ft. near the bridge seat. Measured ground elevations have changed within the last year of up to 1.5 ft. This area should continue to be monitored in future inspections through fathometric surveys.

REPAIR #10019 was created to relocate the ladder and sinker block to prevent further damage to right outer dolphin Piles 2A and 3A.
REPAIR #10020 was created to repair or replace the timber floating dolphin steel pontoons.
REPAIR #10021 was created to repair or replace the timber floating dolphin front anchor chains.
REPAIR #10022 was created to repair the left inner ladder sinker block attachment and to evaluate the need for a left outer dolphin ladder sinker block.

Added an underwater interim inspection for scour at the bridge seat with a 30-month inspection frequency.
Maintain a 60-month underwater inspection frequency.

1677 CHANNEL PROTECTION:
Underwater Inspection Findings:
Channel bottom consists of 2" to 4" diameter cobbles, sand, shells, as well as areas of erodible clay substrate. A significant clay cliff up to 12-ft tall can be found at the bridge seat and a clay hill is behind the left wingwall (Photo UW-1) with an outfall pipe on top of it. Some broken off timber remnant timber piles can be found at the tower and wingwall locations. A cut-off 15-ft high H-pile is just offshore of the left inner dolphin Piles 2C and 2B. A cut-off 8-ft. tall H-pile was also found on the slip side of right inner Pile 1C.

1680 SCOUR:
A scour code of 3 (calculated scour critical) is used programmatically for all WSF slips (bridge seats and tower piles). See Note 8361.

8125 CONCRETE SUBMERGED PILE COLUMN:
Some construction spalls noted on a few precast piles. Several of the pile pick points were not grouted and are rusty.

Underwater Inspection Findings:
The bridge seat has seven 18" octagonal pre-stressed concrete piles. All but two are plumb. Piles 2 and 6 have a 1:3 batter. Piles are all sound and have marine growth up to 1-in (Photo UW-2).

See attached underwater inspection drawings and pile inspection data spreadsheet for locations and details.

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Notes (Continued)

8128 STEEL SUBMERGED PILE/COLUMN:
Underwater Inspection Findings:
The bridge seat now has a total of 8 steel piles in the bridge seat retrofit support frame. The frame has four 24" x 3/4" steel piles and has been enhanced to accommodate four new 30" x 3/4" steel piles added in 2017 (Photos UW-3 and UW-4). The new piles are rusty with no coating. Random thickness readings were taken and no section loss was noted (Photo UW-5).

There are 6 steel piles per tower; 4 batter and 2 plumb (Photo UW-6). Marine growth is typically up to 90% coverage.

See attached underwater inspection drawings and pile inspection data spreadsheet for locations and details.

8130 STEEL PIER CAP/CROSSBEAM:
A retrofit steel cap frame supported on piles was installed to add support for the bridge seat concrete cap and piles that were previously undermined by propeller wash (Element 8128 Photos UW-3 and UW-4 and Photo #58).
Quantity includes three 36 ft. transverse beams and seven 21 ft. longitudinal beams. There are seven WF block-up bearings between the retrofit frame and the concrete bridge seat cap soffit.

Surface rust beginning to show on all support frame members (Photo #124). REPAIR #10018.

8132 CONCRETE PIER CAP/CROSSBEAM:
A few vertical leaching cracks in caps (possibly stains from leaky joint above).

8201 STEEL WELDED GIRDER (FRACTURE CRITICAL):
There are utility brackets welded to the bottom third of the web (Photo #66).
The knee brace that supports the ladder access platform is welded to the girder web near the lower flange.
Girder bottom flanges have rust blooms, with laminar rust and section loss concentratied near the seaward ends. REPAIR #10018.
See attached FC Report for additional details and photo call outs.

8206 STEEL FLOORBEAM:
Bridge seat floorbeam is a built up steel plate girder.
Floorbeam webs at girder connections have paint failure and surface rust with light laminar rust forming (Photo #108). REPAIR #10018.
Floorbeam 0, right side end connection replacement bolt is not painted and is a 3/4" diameter instead of the typical 7/8" diameter (Photo #114). REPAIR #10000.
Floorbeam 9 (end floorbeam with apron pins on sea facing side) has a painted indentation at the left end with no visible rust.
Floorbeam 9 stringer support/floorbeam stiffening plates have heavy laminar rust under the stringers with section loss to 1/4" remaining of 7/16" original thickness (Photo #119) REPAIR #10018 and #10023.

8209 STEEL STRINGER:
The stringer connections at floorbeams are rusty at scattered locations, with higher rust concentrations at FB0 and FB9 (Element 8206 Photo #119 and Photo #109). REPAIR #10018.

8224 THIN POLYMER OVERLAY LESS THAN 0.5":
Polymer overlay on the transfer span applied in the fall of 2007.
Overlay is worn thin in the right lane, with approximately 7 sq. ft. of exposed deck bars.
Overlay has several small spalls totaling 4 sq. ft. (Photo #113).

8225 NON SKID METAL SURFACING:
Apron surfacing has scrapes and gouges, with several narrow patches and missing spots at the hinge (Photo #125).

8301 APRON STEEL ORTHOTROPIC DECK:
Bottom of Apron is scraped and rusted from rubbing on boat (Photo #96). REPAIR #10018.

8305 APRON HINGE MULTI-PLATE AND PIN:
The Apron has four stainless steel hinge pins. Support plates have section loss due to laminar rust, with section reduced to 7/16" from 3/4" at several plate edges (Photo #118) (2 placed in CS3). REPAIR #10018.

8312 APRON HYDRAULIC LIFT ARM AND FITTINGS:
The Lift Arm hydraulic ram is installed parallel to the girder top flange. Surface rust is starting around the welds (Element 8201 photo #95). REPAIR #10018.

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Notes (Continued)

8341 LIFT BEAM:
LIftbeam flanges have surface rust, particulary at the ends of the beam (Element 1 photo #122).
The Steel Open Girder is bolted to the liftbeam with unpainted bolts. Bolts are covered with a thin laminar rust (Element 8201 Photo #120). REPAIR #10018.

8342 LIVE LOAD HANGER BARS (FC):
Underwater Inspection Findings:
Heavy marine growth to serveral inches in the ITZ. Live load hangers appear plumb and both welded angle stops are intact (Photo UW-7).

See attached underwater inspection layout for locations and details.

8343 LIVE LOAD LOCKING PINS AND ACTUATOR (FC):
Refer to Element 1 note for comments on lower live load hanger pins and tension link pins.
Ultrasonic Testing of the live load (LL) hanger pins done 9/14/2015 and is due in 2021 (72 month frequency). See attached FC Report for results.

8361 SCOUR:
Underwater Inspection Findings:
Scour is evaluated as part of the underwater inspection and through annual soundings performed by WSF. Quantity includes the bridge seat pier and both towers combined as a pier.

Scour and a large undermining cave was found near the towers and bridge seat in 2001. The bridge seat has had a total of 2 scour repairs since. See Element 8128 Photos UW-3 and UW-4. There is a difference of approximately 20 ft. vertically between the onshore batter piles to the new steel piles of the bridge seat.

See attached underwater inspection bridge seat drawing for locations and details.

8413 STEEL TOWER:
The left steel tower midpoint horizontal member has a repaired seam crack (Photo #106)

8451 STEEL PILE FRAME WINGWALLS:
Wingwalls have moderate rust on the weld seams of the steel pile frame gusset plates and the U-bolts and nuts are heavily corroded.
One head is sheared off in the inshore end of the left wingwall (LW).
Left wingwall has a waler detached at the base (3rd from sea end).

Underwater Inspection Findings:
Wingwall piles typically have marine growth up to 1" with nearly full coverage from mudline (MDL) to the intertidal zone (ITZ).
Random D-meter thickness readings were taken of the wingwall piles (Photo UW-8).

Left wingwall fender piles have pitting with section loss up to 20% from MDL up to MDL + 13' (Photo UW-9). Right wingwall fender piles have pitting up to MDL+5. Pile 1B has pitting with up to 40% section loss.

See attached underwater inspection layout and pile inspection data spreadsheet for locations and details.

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Notes (Continued)

8462 STEEL PILE FRAME DOLPHINS:
Underwater Inspection Findings:
Level II cleanings were performed at random locations of steel piles (Photo UW-10). A pit guage was used to measure the depths of pits into the steel (Photo UW-11).

Left outer (LO) dolphin has some piles with section loss. Pile 1A has deep pitting bottom 3-ft. with up to 22% section loss within the pitted area.
Right inner (RI) dolphin piles typically have localized pitting. Pile 1A had a pit with up to 30% section loss (Photo UW-11).
Right midship (RM) dolphin Pile 2A has a 6" diam. area with 34% section loss.
Right outer (RO) piles have section loss. Fender Pile 1 has a small area with up to 38% section loss. Fender Pile 3 has up to 24% in a bad area. Fender Pile 7 has a small area with up to 15% section loss. Fender Pile 12 has an area with section loss up to 32%. Pile 2A has an area with up to 12% section loss. The ladder sinker block is rubbing and hitting Piles 2A and 3A (Photos UW-12 and UW-13). REPAIR #10019. No section loss was noted.

See attached underwater inspection layout and pile inspection data spreadsheet for locations and details.

8463 TIMBER FLOATING DOLPHIN:
Floating Timber Dolphin has loose rubbing plastic sheathing on the inshore end. There are a couple abraded transverse bottom walers at the end (Photo #17).
Float is listing as noted in the Underwater Inspection Findings.
Bracing diagonals are numbered from the shore end.
High transverse bracing diagonals 1, 3, 4, 5, 9, 10, and the interior longitudinal offshore end brace are Red Tagged (Photo #69).
High transverse bracing diagonal 11 and 12 are yellow tagged. One low transverse bracing diagonals, and one longitudinal braces are yellow tagged.

Underwater Inspection Findings:
Pontoons, chains, and anchors were inspected. The timber dolphin is listing into the water offshore slipside where it's 1.5 ft. lower than the inshore left (Photo UW-14). Two of the slip side pontoons have large holes up to 3'(W) x 6' (L) with disintegrating flotation material visible inside (Photos UW-15 and UW-16). REPAIR #10020.

Both back chains (B1 and B2) are in satisfactory condition with section loss up to 20% (Photo UW-17). Both back chains disappear into the sand and their anchors were not located. All three front (slip side) chains were found to have section loss just below the pontoon to where they hit the ground. Chain F1 had up to 20% overall section loss of chains (Photo UW-18), Chain F2 has up to 50% overall section loss, and Chain F3 has up to 75% of overall section loss and fretting (Photos UW-19 and UW-20). REPAIR #10021.

The F1 anchor is partially set into a clay substrate area just left of the Slip 2 right inner dolphin. The F2 inside anchor is laying flat without its fluke dug in and the end anchor is dug in sideways with its stock vertical. The F3 anchor is laying at an acute angle offshore and back to the left against the chain instead of in-line with the chain (Photo UW-21).

See attached underwater inspection layout and pile inspection data spreadsheet for locations and details.

8810 METAL BRIDGE RAILING:
Metal traffic rail on the aprons is galvanized 2-1/2" square tube. Metal rail on headframe has some damaged birdwire.

8901 PROTECTIVE COATING - BRIDGE:
Paint quantity is a rough estimate.
Paint on through girders is thin and chalky on webs and there are rust blooms on the sharp edges of the girder flanges.
Paint is blistering on top flange of left steel girder.
Paint is failing with surface rust forming on connections, web, and flanges for multiple steel elements. See details in elements 1, 8130, 8201, 8206, 8209, 8301, and 8305. REPAIR #10018.

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Notes (Continued)

8902 PROTECTIVE COATING - PILING:
Steel piles in towers, wingwalls, and dolphins have seam rust on weld joints and rust blisters.

Underwater Inspection Findings:
Underwater coating condition estimates are generally from MDL to water surface if not otherwise stated.
Bridge seat 30" diameter piles were uncoated per plans so they were not included in the quantities.

TL piles overall have 1% coating failure to ITZ. A piles have 50% coating failure bottom 6-ft. B piles have 1 sq. ft. of coating failure 2 to 3 feet off the bottom.
TR piles overall have 1% coating failure to the ITZ. Pile 1A is 5% to the ITZ. TR Pile 1A has 10% section loss in one bad area at MDL.
LW piles have coating failure. Pile 1B bottom 9-ft. has 75% coating failure. Pile 1C bottom 9-ft. has 75% coating failure. Pile 1D bottom 13-ft. has 75% coating failure.
RW Piles 1B and 1D have 75% coating failure bottom 5-ft. Pile 1C has 75% coating failure bottom 3-ft. Piles 1C and 1D has 5% coating failure bottom 3 and 5-ft.
LO Pile 1A has 10% coating failure bottom 3-ft. LO B piles all has 2% coating failure bottom 2-ft.
RI cluster has 1% coating failure to ITZ.
RO piles have coating failure of up to 50% in some small areas or bands near MDL. Piles 2A and 3A each have 2 sq. ft. of coating failure due to the ladder sinker block rubbing the piles.
RM Pile 1B has 5% coating failure from MDL+10 to MDL+20.

See attached underwater layout and pile inspection data spreadsheet for locations and details.

8910 SAFETY ACCESS LADDERS:
Total of seven ladders noted on TR, LW, RW, LI, LO, RM, and RO.

Underwater Inspection Findings:
LI dolphin has ladder with sinker block tied on right side to rungs by a rope (Photo UW-22). The rope is deteriorating. The LO dolphin ladder does not have a sinker block and the ladder shows no attachments or holes for attachments (Photos UW-23 and UW-24). REPAIR #10022.

See attached underwater inspection layout for locations and details.

Repairs

Repair No	Pr	R	Repair Descriptions	BMS	Noted	Maint	Verified
10000	2	B	Replace the rusty 3/4" diameter A325 bolt with a 7/8" diameter A325 bolt and paint the new bolt. (Right side of the bridge seat floorbeam to girder connection)	8206	9/2/2008		
10018	1	B	Paint on the bottom flange of open girders, gussets, liftbeam, liftbeam bolts, stingers, floorbeams, apron hinge pins, and apron lift connections to girder top flange have numerous rust blooms. See referenced photos for typical and specific locations. At locations of rust blooms clean to bright steel, prime, and paint. 2019 - CRT/MDM - Added locations to repair and updated/added photos.	1, 8130, 8201, 8206, 8209, 8301, 8305, 8341, 8901	9/14/2015		
10019	2	B	Relocate right outer dolphin (RO) sinker block and ladder away from Piles 2A and 3A that are being damaged.	8462	10/11/2017		
10020	1	B	Repair or replace the timber floating dolphin steel pontoons with gaping holes.	8463	10/11/2017		
10021	1	B	Repair or replace timber floating dolphin Chains F2 and F3 which have links with 50% and 75% overall section loss near the dolphin.	8463	10/11/2017		
10022	2	B	Replace LI dolphin ladder sinker block rope attachment and evaluate the need for a sinker block on the LO dolphin ladder.	8910	10/11/2017		

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Repairs (Continued)

Repair No	Pr	R	Repair Descriptions	BMS	Noted	Maint	Verified
10023	1	B	Floorbeam 9 stringer support/floorbeam stiffening plates have section loss under the stringer, with 1/4" remaining of 7/16" original thickness. Evaluate need to reinforce these plates based on current section loss.	8206	9/10/2019		

Inspections Performed and Resources Required

Report Type	Date	Freq	Hrs	Insp	CertNo	Coinsp	Note
Routine	9/10/2019	24	1.0	CRT	G1325	MDM	

Resources	Hours	Min	Pref	Max	Freq Date	Need Date	Override	Notes
Boat								Boat needed to access in water elements and under the transfer span.
Third Party Notification								Washington State Ferries Terminal Staff may participate in this inspection as necessary to gather repair information. Contact Tom Castor at WSF 206-515-3727. Send QN's (Quick Notices) to WSF Shore Operations, Maintenance and Vessel Operations.
Tides								High tide needed to access underside of transfer span.

Report Type	Date	Freq	Hrs	Insp	CertNo	Coinsp	Note
Fracture Critical	9/10/2019	24	1.0	CRT	G1325	MDM	

Resources	Hours	Min	Pref	Max	Freq Date	Need Date	Override	Notes
Special Equipment								Top Live Load Hanger Pins to be ultrasonically tested as Fracture Critical members on 72 month frequency. Last done in 2015, due in 2021.

Report Type	Date	Freq	Hrs	Insp	CertNo	Coinsp	Note
Underwater	10/11/2017	60	7.0	RMP	G1215	JRWH	Underwater inspection by WSDOT Dive Team.

Resources	Hours	Min	Pref	Max	Freq Date	Need Date	Override	Notes
Boat	6.00							24' Duckworth launched from adjacent Port of Kingston boat ramp. Parking fee was $7/day in 2017. Kiosk accepted credit cards.
Third Party Notification								Contact Tom Castor at WSF 206-515-3727 to find out about repair contracts, on site contacts, and his concerns for this structure. Send QN's (Quick Notices) to WSF Shore Operations, Maintenance and Vessel Operations 48hrs prior to inspection.
Third Party Notification								2017 UW on site contact to coordinate painting contractor and Dive Team was WSF Constr. Engineer Josh Reynolds @(206)915-2088.
Third Party Notification								Call USCG Seattle Sector (206.217.6001) prior to arrival and after departure for the day.

Report Type	Date	Freq	Hrs	Insp	CertNo	Coinsp	Note
Special Feature	9/10/2019	24	1.0	CRT	G1325	MDM	The Special Inspection is done to look at moving portions of the Ferry Terminal including the Lift Beam, Live Load Hanger, Lift Span, Counter Weight Sheaves, and the Apron.
UW Interim		30					WSDOT BPO Dive Team to inspect the Aux. Slip 1 bridge seat piles, check scour by measuring all elevations onshore and offshore of piles, and measure the extents of the erodible clay cliff. See 2017 underwater inspection drawings bridge seat layout and pile inspection data spreadsheet.

Resources	Hours	Min	Pref	Max	Freq Date	Need Date	Override	Notes
Boat								Use dive boat. Launch from adjacent Port of Kingston boat ramp. Parking fee was $7/day in 2017. Kiosk accepted credit cards.

Status: Released | Printed On: 11/13/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

Inspections Performed and Resources Required (Continued)

Report Type	Date	Freq	Hrs	Insp	CertNo	Coinsp	Note
Third Party Notification							Call USCG Seattle Sector (206.217.6001) prior to arrival and after departure for the day.
Third Party Notification							Contact Tom Castor at WSF 206-515-3727 to find out about repair contracts, on site contacts, and his concerns for this structure. Send QN (Quick Notice) to WSF Shore Operations Maintenance and Vessel Operations 48hrs prior to inspection.

Washington State Department of Transportation

VISUAL FRACTURE CRITICAL INSPECTION REPORT

Bridge Name:	KINGSTON (AUX.-SLIP 1)	**Date:**	9/10/2019
Bridge No:	104/12FT	**Hours:**	1
Structure ID:	0016191A	**Inspector ID #:**	G1325
Structure Type:	MOVEABLE BRIDGE	**Lead Inspector Initials:**	CRT
Agency:	WSF	**Co-Inspector Initials:**	MDM
Milepost:	24.44		

Lead Inspector Signature:

Co-Inspector Signature: David R Brun for mdm

Inspected Items and Procedures:

Welded Girder

1. As required, use mirrors or other equipment to check inside surfaces of Fracture Critical Members (FCM's).
2. Check for loose or unevenly loaded member sub-elements.
3. Check all welds at connection plates, with emphasis on skip welds and changes in section.
4. Check for any welds, including plug, tack, or repair welds. Record location of welds, regardless of condition, and document weld type and category.
5. Check FC members and associated connection or gusset plates for areas of heavy or pitted corrosion, nicks, gouges, sharp bends, and collision damage. Record location of all these conditions and estimated section loss, if applicable.
6. Check all heat straightened or repaired areas. Record location of these areas, regardless of condition.

Pins and Anchor Bolts

1. As required, use mirrors or other equipment to check inside surfaces of FCM's.
2. Check for pitting, laminar rust, surface deformation, and pack rust. It is important to check the pin, pin nuts, and all members surrounding the pin for this kind of steel deterioration.
3. Check for mobility and noise of pin and surrounding members. If the pin is physically "frozen" it is important to note this because the added stress can affect other members in the structure.
4. Observe and record abnormalities like; alignment, pin wear, loose pin nuts, and amount of nut engagement. It's important to note that full nut engagement is when the nut is flush with the pin or the pin is extending past the nut.
5. Check for paint system failure on pin nuts, pin, and surrounding members.

FCM Location	FCM Type	FCM Per Girder or Truss Line	Beist Server Plans		
			Sh. No.	Contract	Sh. Name
Transfer Span Girder	Tension Welds	1	T2		See Attached Files
Lift Beam	Hanger Slotted Bar, Pins	3	T1		See Attached Files
Tower	Live Load Hanger Pin	1	T1		See Attached Files

Note: FCM = Fracture Critical Member

Washington State Department of Transportation

VISUAL FRACTURE CRITICAL INSPECTION REPORT

Bridge Name:	KINGSTON (AUX.-SLIP 1)	**Date:**	9/10/2019
Bridge No.:	104/12FT	**Hours:**	1
Structure ID:	0016191A	**Inspector ID #:**	G1325
Structure Type:	MOVEABLE BRIDGE	**Lead Inspector:**	CRT
Agency:	WSF	**Co-Inspector:**	MDM
Milepost:	24.44		

Truss / Girder	Span	Location	Feature Inspected	Detail Description	Remarks
Left	19A	Girder	Welds	Flanges, Web, Stiffeners, and Fittings in Tension	At offshore end of top flange the apron lift support weld, there is rust on the weld and the weld has a 3/32" undercut on the base metal, see **Photo #95.** Bottom flange has laminar rust up to 1/8" thick at several locations.
Right	19A	Girder	Welds	Flanges, Web, Stiffeners, and Fittings in Tension	Bottom flange has laminar rust with section loss. Exterior bottom flange on the seaward side of the liftbeam has 7/16" remaining in the flange, down from 3/4" thick, see **Photo #120.**
Left	19A	Girder	Cope	Offshore Floorbeam, FB-10	Painted-over web cope crease.
	19A	Lift beam	Girder	Bottom Flange	No Defects Noted.
Right	19A	Lift beam	Pin*	Bottom Live Load Hanger Pin	5-1/4" hollow hydraulic pins. No defects noted
Right	19A	Tower	Pin	Top Live Load Hanger Pin	Cotter pin is not fully bent, but is securely in place.
Right	19A	Lift Beam	Pins*	Bottom of tension link seaside pin	Pins in double shear. No Defects Noted.
Right	19A	Lift Beam	Pins*	Bottom of tension link shore side pin	Pins in double shear. No Defects Noted.
Left	19A	Lift Beam	Pin*	Bottom Live Load Hanger Pin	5-1/4" hollow hydraulic pins. No defects noted

Washington State Department of Transportation

VISUAL FRACTURE CRITICAL INSPECTION REPORT

Bridge Name:	KINGSTON (AUX.-SLIP 1)	**Date:**	9/10/2019
Bridge No.:	104/12FT	**Hours:**	1
Structure ID:	0016191A	**Inspector ID #:**	G1325
Structure Type:	MOVEABLE BRIDGE	**Lead Inspector:**	CRT
Agency:	WSF	**Co-Inspector:**	MDM
Milepost:	24.44		

Truss / Girder	Span	Location	Feature Inspected	Detail Description	Remarks
Left	19A	Tower	Pin	Top Live Load Hanger Pin	No Defects Noted.
Left	19A	Lift Beam	Pins*	Bottom of tension link seaside pin	Pins in double shear. No Defects Noted.
Left	19A	Lift Beam	Pins*	Bottom of tension link shore	Pins in double shear. No Defects Noted.

* Lower lift beam pins and lower live load pins UT test do not return usable results. Pins are visually inspected only.

Washington State Department of Transportation

UT INSPECTION REPORT for PINS

Bridge Name:	KINGSTON (AUX.-SLIP 1)	**Date:**	9/10/2019
Bridge No:	104/12FT	**Hours:**	1.0
Structure ID:	0016191A	**Inspector ID #:**	G1325
Structure Type:	MOVEABLE BRIDGE	**Lead Inspector's Initials:**	CRT
Agency:	WSF	**Co-Inspector Initials:**	MDM
Milepost:	24.44		

Inspected items: Pins

Procedures:

Pins
1. When possible, test from both ends of pins.
2. Verify pin length shown on back reflection with plans. If back reflection does not match the plans, conduct manual length measurement and document correct pin length.
3. Start test with transducer at or near pin center for back reflection check, then run transducer around full perimeter of pin, searching for indications or significant loss of back reflection.
4. Whenever the test suggests that there is a defect in a pin, store and print out the indication with all associated equipment and settings documented. The location of the transducer shall also be documented using a clock hand convention (1 O'clock to 12 O'clock).

UTM Location	UTM Type	UTM Per Girder or Truss Line	'Beist' Server Plans		
			Sh. No.	Contract	Sh. Name
Towers	Shouldered Pins	1	T1		See Attached File

CS1: Number of pins and associated connection plates that are in good condition. There may be minor rust or shallow surface deformations on the exposed pin surfaces. Minor amounts of rust powder or paint damage may be present suggesting minor pin rotation in place. No pack rust is present between associated connection plates. There is no noise associated with the pin connection. Apron and Live Load pins are effectively inspected by visual means. When UT is possible, it can be used as a vehicle to downgrade a pin due to indications. Pins that cannot be U.T'd because of geometry can still be in CS1.

CS2: Number of live load hanger pins that have throw mechanism repairs. Number of hinge pins that have plate repairs, replaced keeper bars or cotter pins. Ultrasonic Testing: Pins with indications less than 10% of the far shoulder reflection height.

CS3: Number of pins and associated connection plates that have defects that may affect the strength or serviceability of the bridge. Significant corrosion may be present, suggesting that pins are frozen in place. Significant abnormalities may be observed in alignment, pin wear, or deck joint movement. Pack rust may be present between connection plates that place a jacking force between the plates and pin nuts. The connection may have significant amounts of rust powder and/or make noise under loading. Pins that can be UT inspected have indications between 10 and 30 percent of the far shoulder reflection height.

CS4: Number of pins and associated connection plates that have defects that are judged to affect the strength or serviceability of the bridge. There are frozen pins designed for free rotation as part of normal bridge movement. Pack rust is present between connection plates that is causing distortion/displacement of plates or pins. Pins that can be UT inspected have indications greater than 30 percent of the far shoulder reflection height. Pin replacement is required.

Washington State Department of Transportation

PIN'S INSPECTION SCHEDULE

Bridge Name: KINGSTON (AUX.-SLIP 1)
Bridge No.: 104/12FT
Structure ID: 0016191A
Structure Type: MOVEABLE BRIDGE
Agency: WSF
Milepost: 24.44

Date: 9/10/2019
Hours: 1
Inspector ID #: G1325
Lead Inspector: CRT
Co-Inspector: MDM

Truss / Girder	Span	Location	Detail Description	Redundant	Condition State		Freq. (Months)	UT Inspection Date (YEAR)	Next Inspection Date (YEAR)
					VT	UT			
Left	19A	Tower Frame	Upper LL Hanger Pin	no	1	1	72	2015	2021
Left	19A	Lift Beam	Lower LL Inboard	no	1	N/A	72	2015	2021
Left	19A	Lift Beam	Lower LL Outboard	no	1	N/A	72	2015	2021
Right	19A	Tower Frame	Upper LL Hanger Pin	no	1	1	72	2015	2021
Right	19A	Lift Beam	Lower LL Inboard	no	1	N/A	72	2015	2021
Right	19A	Lift Beam	Lower LL Outboard	no	1	N/A	72	2015	2021

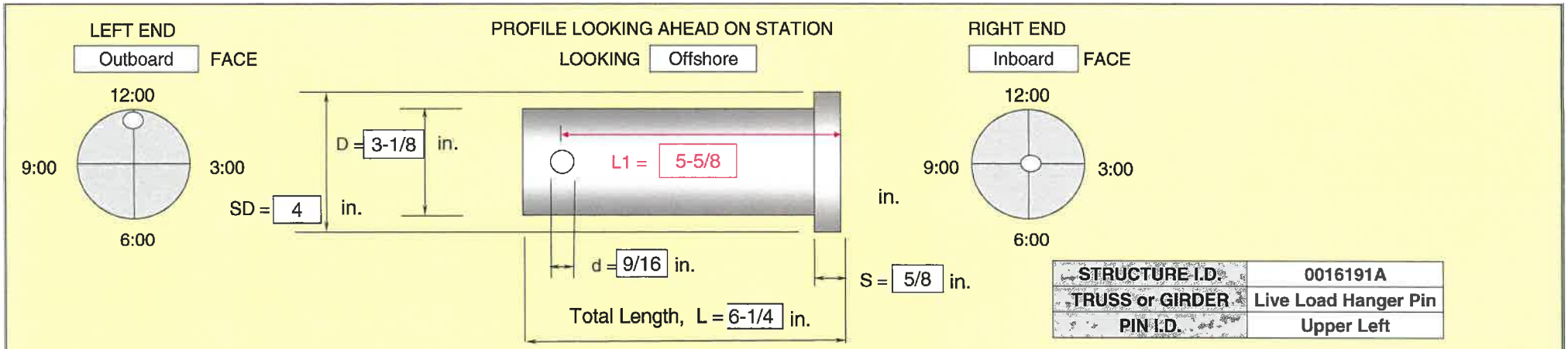
UT from Lift beam pins does not return usable results. Pins are visual inspected only.

Washington State Department of Transportation

PIN SUMMARY SHEET

Bridge Name:	KINGSTON (AUX.-SLIP 1)	**Date:**	9/10/2019
Bridge No.:	104/12FT	**Hours:**	1
Structure ID:	0016191A	**Inspector ID #:**	G1325
Structure Type:	MOVEABLE BRIDGE	**Lead Inspector:**	CRT
Agency:	WSF	**Co-Inspector:**	MDM
Milepost:	24.44		

Truss / Girder	Span	Location	Detail Description	Condition State							
				2007	2009	2011	2013	2015	2017	2019	2021
Left	19A	Tower	Upper LL Hanger Pin	1	1	1	1	1	1	1	
Left	19A	Lift Beam	Lower LL Inboard	1	1	1	1	1	1	1	
Left	19A	Lift Beam	Lower LL Outboard	1	1	1	1	1	1	1	
Right	19A	Tower	Upper LL Hanger Pin	1	1	1	1	1	1	1	
Right	19A	Lift Beam	Lower LL Inboard	1	1	1	1	1	1	1	
Right	19A	Lift Beam	Lower LL Outboard	1	1	1	1	1	1	1	



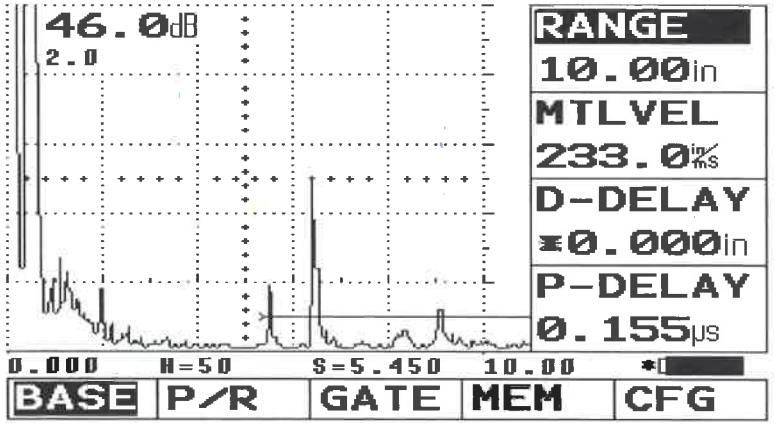
STRUCTURE I.D.	0016191A
TRUSS or GIRDER	Live Load Hanger Pin
PIN I.D.	Upper Left

September 14, 2015

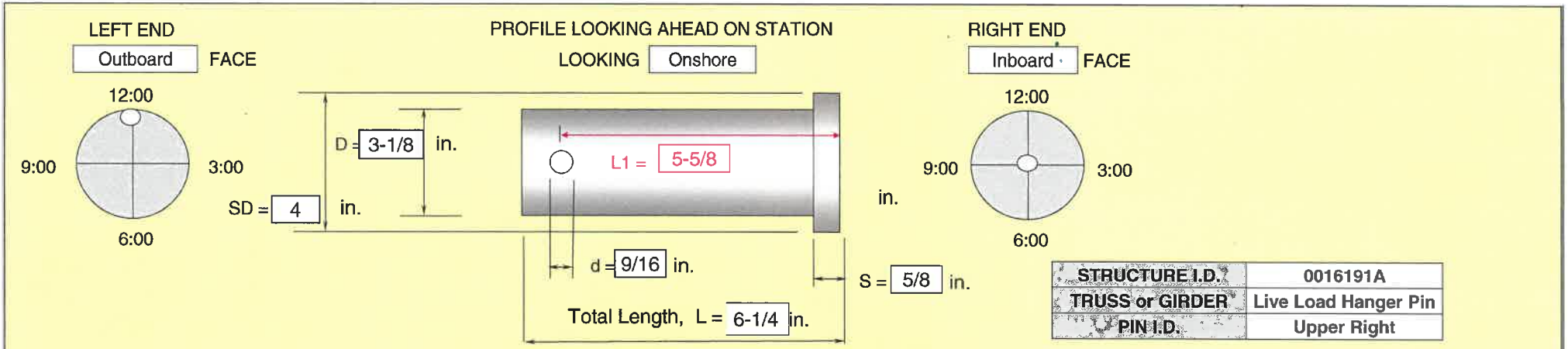
<<<<<<<< LEFT END >>>>>>>>	<<<<<<<< RIGHT END >>>>>>>>
COMMENTS: No indications.	COMMENTS: No indications.

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION BRIDGE PRESERVATION

BRIDGE NAME:	KINGSTON (AUX. - SLIP 1)	DATE:	09/30/2009
BRIDGE NO.:	104/12FT	STRUCTURE ID:	0016191A
LEAD INSPECTOR:	SHAWN M PLICHTA	INSPECTOR NO.:	G0407
CO-INSPECTOR:	JANICE R PARKER	TRANSDUCER USED:	0.75" X 2.25" MHz
UT MODEL:	KK USM 22L BNC	TRANSDUCER MODEL:	KK GAMMA RHP
UT SERIAL NO.:	X521A3a	PIN LOCATION:	HEADFRAME UPPER LEFT



DB GAIN	46.0dB			dB-STEP	2.0
DW RANGE	10.00in	PF PRF-MOD	10	AM aLOGIC	pos
SV MTLVEL	233.0in/ms	FR FREQU	0,1 - 1	AD aSTART	5.437in
DD D-DELAY	*0.000in	RJ REJECT	0%	AW aWIDTH	7.618in
PD P-DELAY	0.155us	DM DUAL	off	AT aTHRSH	10%
2D bSTART	10%	ND SET-#	* 24	LC CONTR	50
2T bTHRSH	30%	RD RECALL	off	LT LIGHT	off
		SD STORE	off	PR PRINTER	Epson
		EA DELETE	off	DG DIALOG	English
VS S-DISP	off	E1 R-start	0.000in		
FI FILLED	off	E2 H=	50%		
UN UNIT	inch	E3 S=	5.450in		
		E4 R-end	10.00in		
CM COPYMOD	pardump	BR BAUD-R	9600	LE LENGTH	8 bit



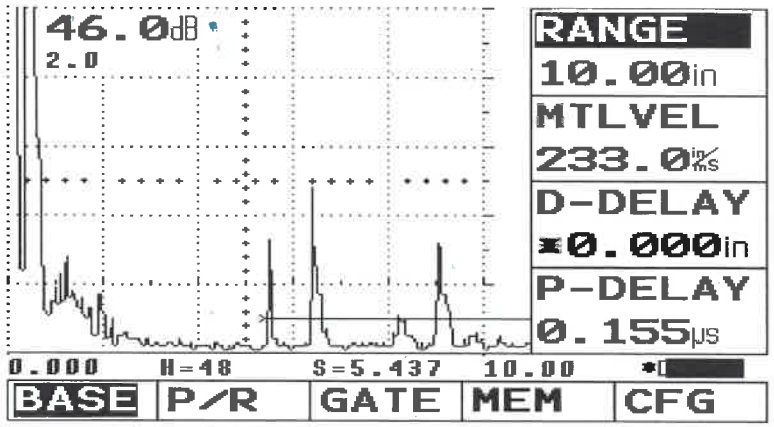
STRUCTURE I.D.	0016191A
TRUSS or GIRDER	Live Load Hanger Pin
PIN I.D.	Upper Right

September 14, 2015

<<<<<<<< LEFT END >>>>>>>>	<<<<<<<< RIGHT END >>>>>>>>
COMMENTS: No indications.	COMMENTS: No indications.

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION BRIDGE PRESERVATION

BRIDGE NAME:	KINGSTON (AUX. - SLIP 1)	DATE:	09/30/2009
BRIDGE NO.:	104/12FT	STRUCTURE ID:	0016191A
LEAD INSPECTOR:	SHAWN M PLICHTA	INSPECTOR NO.:	G0407
CO-INSPECTOR:	JANICE R PARKER	TRANSDUCER USED:	0.75" X 2.25" MHz
UT MODEL:	KK USM 22I, BNC	TRANSDUCER MODEL:	KK GAMMA RHP
UT SERIAL NO.:	X521A3a	PIN LOCATION:	HEADFRAME UPPER RIGHT



DB GAIN	46.0dB			dB-STEP	2.0
DW RANGE	10.00in	PF PRF-MOD	10	AM aLOGIC	pos
SV MTLVEL	233.0in/ms	FR FREQU	0,1 - 1	AD aSTART	5.437in
DD D-DELAY	*0.000in,	RJ REJECT	0%	AW aWIDTH	7.618in
PD P-DELAY	0.155us	DM DUAL	off	AT aTHRSH	10%
2D bSTART	10%	ND SET-#	* 25	LC CONTR	50
2T bTHRSH	30%	RD RECALL	off	LT LIGHT	off
		SD STORE	off	PR PRINTER	Epson
		EA DELETE	off	DG DIALOG	English
VS S-DISP	off	E1 R-start	0.000in		
FI FILLED	off	E2 H=	48%		
UN UNIT	inch	E3 S=	5.437in		
		E4 R-end	10.00in		
CM COPYMOD	pardump	BR BAUD-R	9600	LE LENGTH	8 bit

WSBIS Field Inventory Report

Washington State Department of Transportation

Approved		
Revised		
RFC		
AAN		
Not Reviewed		

Bridge ID WB71

1001 Structure ID	2009 Bridge Number	2132 Bridge Name	1019 Owner	1021 County	2023 City	1156 Location	1188 Latitude	1196 Longitude
0016191A	104/12FT	KINGSTON (AUX.-SLIP 1)	22	18	0000	9.1 E JCT SR 3	47° 47' 42.50"	122° 29' 41.80"

Facilities WB72

1232 Feature Intersected	1256 Facilities Carried	1274 Region	1286 Custodian	1288 Parallel	1289 Temporary
APPLE TREE COVE	SR 104	OL	22	N	

Shaded fields are to be reviewed each inspection.

Fields in *italics* are for information only & are not editable.

Layout WB73

1332 Year Built	1336 Year Rebuilt	1340 Bridge Length	2346 NBIS Length	1348 Maximum Span Length	1352 Lanes On	1356 Curb to Curb Deck Width	1360 Out to Out Deck Width	1364 Sidewalk Left	1367 Sidewalk Right	1370 Min Vert Over Deck	1374 Min Vert Under	1378 Vert Code	1379 Min Lat Under Right	1382 Lat Code	1383 Min Lat Under Left	1386 Navigation Control Code	1397 Approach Roadway	1310 Skew Angle	1312 Flared	1291 Median
1986	2001	105		80	2	20.0	24.0	1.5	1.5	16' 00"	00' 00"	N	0.0	N	0.0	0	20	0	N	0

Crossing Route On WB74

2000 Main Code	1432 On Under	1433 Hwy Class	1434 Service Level	1435 Route Number	2440 Milepost	1445 ADT	1451 Truck %	2402 Crossing Description	1487 Funct. Class	1490 Lane Use Direction	1354 Total Lanes Under	1491 Horizontal Clearance Route Dir	1495 Horizontal Clearance Reverse Dir	1499 Max Vert Clearance Route	2500 *Min Vert Clearance Route*	2501 *Max Vert Clearance Reverse*	2502 *Min Vert Clearance Reverse*	1413 Detour Length
M	1	3	1	00104	24.44	10000	8	KINGSTON (AUX.-SLIP 1)	02	4	0	20' 00"		16' 00"	*16' 00"*			0

Route On

Crossing Route Under WB74

2000 Main Code	1432 On Under	1433 Hwy Class	1434 Service Level	1435 Route Number	2440 Milepost	1445 ADT	1451 Truck %	2402 Crossing Description	1487 Funct. Class	1490 Lane Use Direction	1354 Crossing Lanes Under	1491 Horizontal Clearance Route Dir	1495 Horizontal Clearance Reverse Dir	1499 Max Vert Clearance Route	2500 *Min Vert Clearance Route*	2501 *Max Vert Clearance Reverse*	2502 *Min Vert Clearance Reverse*	1413 Detour Length

Route Under

Design WB75

1532 Main Span Material	1533 Main Span Design	1535 Appr Span Material	1536 Appr Span Design	1538 Number Main Spans	1541 Number Appr Spans	1544 Service On	1545 Service Under	1546 Deck Type	1547 Wearing Surface	1548 Membrane	1549 Deck Protect	1551 Oper Rating Method	1552 Oper Rating Tons	1553 Oper Rating Factor	1554 Inv Rating Method	1555 Inv Rating Tons	1556 Inv Rating Factor
3	15	0	00	1	0	1	5	4	1	N	N	1	47		1	28	

NBIS Risk Category
High Risk

Printed Date
11/13/2019

Inspection Report Types

2920 Inspection	1990 Date	2646 Inspector	2649 Cert No	2654 Co-Inspector
Routine	9/10/2019	CRT	G1325	MDM
Fracture Critical	9/10/2019	CRT	G1325	MDM
Special Feature	9/10/2019	CRT	G1325	MDM
Underwater				
UW Interim				

Inspection	Date	Inspector	Cert No	Co-Inspector
Interim				
In Depth				
Damage				
PRM Safety				
SEC Safety				

Inspection	Date	Inspector	Cert No	Co-Inspector
Condition				
Short Span				
Geometric				
Info				
Inventory				

Control Data Guid: fb09554e-6714-4ced-9b6c-c55547f87c3bf Control Data Date: 9/16/2019

Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

SI-115

0 Orientation

Photo Type: D - Deck

Orientation: Sea

Date: 9/20/2017

Repairs:

Deck

SI-116

0 Orientation

Photo Type: E - Elevation

Orientation: Right

Date: 9/20/2017

Repairs:

Elevation

Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

UW-0

0 Orientation

Photo Type: W - UW Cover

Orientation: Shore

Date: 10/11/2017

Repairs:

Kingston Aux. Slip 1 throat looking onshore.

SI-121

1 Fracture Critical Inspection Notes

Photo Type: G - General

Orientation: UP

Date: 9/10/2019

Repairs:

Right Lower Live Load (LL) Hanger Pin. Looking up.

Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

SI-122

1 Fracture Critical Inspection Notes

Photo Type: R - Repair

Orientation: DN

Date: 9/10/2019

Repairs: 10018

Two bottom tension link pins in the right end of the lift beam. Looking down.

UW-1

1677 Channel Protection

Photo Type: G - General

Orientation: Left

Date: 10/11/2017

Repairs:

Erodible clay cliff behind the left wingwall. Color has been reduced for clarity.

Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

UW-2

8125 Concrete Submerged Pile/Column

Photo Type: G - General

Orientation: Right

Date: 10/11/2017

Repairs:

Bridge seat piles are all sound and have marine growth up to 1-in. Note the erodible clay cliff to the right of pile.

UW-3

8128 Steel Submerged Pile-

Photo Type: G - General

Orientation: Shore

Date: 10/11/2017

Repairs:

The bridge seat scour repair frame has been enhanced to accommodate 4 new 30" x 3/4" non coated steel piles added in 2017.

Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

UW-4

8128 Steel Submerged Pile-

Photo Type: I - In Depth

Orientation: Shore

Date: 10/11/2017

Repairs:

Close-up of enhanced bridge seat scour repair frame.

UW-5

8128 Steel Submerged Pile-

Photo Type: I - In Depth

Orientation: DN

Date: 10/11/2017

Repairs:

Random thickness readings of the steel piles were taken. Bridge seat Pile 1AL is shown looking down.

Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

UW-6

8128 Steel Submerged Pile-

Photo Type: G - General

Orientation: Right

Date: 10/11/2017

Repairs:

Slip 1 has 6 steel piles per tower; 4 batter and 2 plumb.

MI-58

8130 Steel Pier Cap-

Photo Type: S - Scour

Orientation:

Date: 8/26/2004

Repairs:

15 to 20 ft. deep area of scour from ferry prop wash between the towers and the bridge seat (estimated based on diver depth gage).

Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

SI-124

8130 Steel Pier Cap-

Photo Type: R - Repair

Orientation: Right

Date: 9/10/2019

Repairs: 10018

Surface rust on bridge seat retrofit components.

MI-66

8201 Steel Open Girder, (FC)

Photo Type: G - General

Orientation: Sea

Date: 7/12/2005

Repairs:

Right girder utility bracket welded to tension zone of web.

Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

SI-95

8201 Steel Open Girder, (FC)

Photo Type: R - Repair

Orientation: Sea

Date: 9/12/2011

Repairs: 10018

Left Girder offshore end of top flange the apron lift support weld, there is rust on the weld and base metal is 3/32" undercut.

SI-120

8201 Steel Open Girder, (FC)

Photo Type: R - Repair

Orientation: Left

Date: 9/10/2019

Repairs: 10018

Right Girder bottom flange at seaward side of liftbeam, showing section loss to flange and general rust at connection.

Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

SI-108

8206 Steel Floor Beam

Photo Type: R - Repair

Orientation: Shore

Date: 9/17/2015

Repairs: 10018

Floorbeam 6, left side shown, typical paint failure and corrosion.

SI-114

8206 Steel Floor Beam

Photo Type: R - Repair

Orientation: Shore

Date: 9/20/2017

Repairs: 10000

Replaced bolt in FB to right girder connection unpainted. Bolt looks undersized; 3/4" vs. 7/8".

Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

SI-119

8206 Steel Floor Beam

Photo Type: R - Repair

Orientation: Sea

Date: 9/10/2019

Repairs: 10018, 10023

Floorbeam 9 section loss to stringer support stiffening plate.

SI-109

8209 Steel Stringer

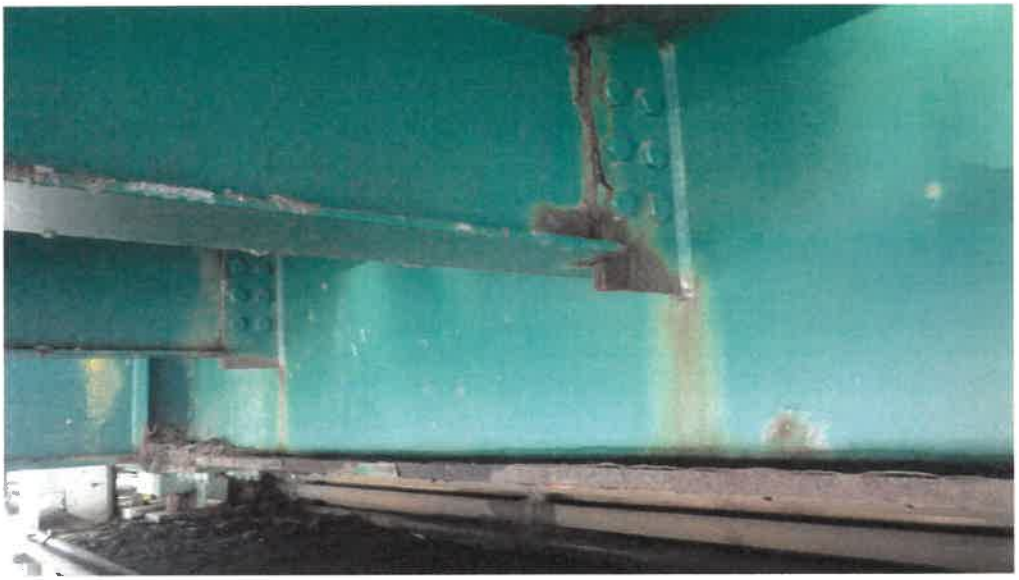
Photo Type: R - Repair

Orientation: Shore

Date: 9/17/2015

Repairs: 10018

The stringer connections at FB 0 are rusty.



Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

SI-113

8224 Thin Polymer Overlay less Than 0.5 Thick-

Photo Type: G - General

Orientation: Sea

Date: 9/20/2017

Repairs:

Shallow spalls in overlay.

SI-125

8225 Non-skid Metal Surfacing

Photo Type: G - General

Orientation: Sea

Date: 9/10/2019

Repairs:

Wear to non skid surfacing on apron.

Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

SI-96

8301 Apron Steel Orthotropic Deck

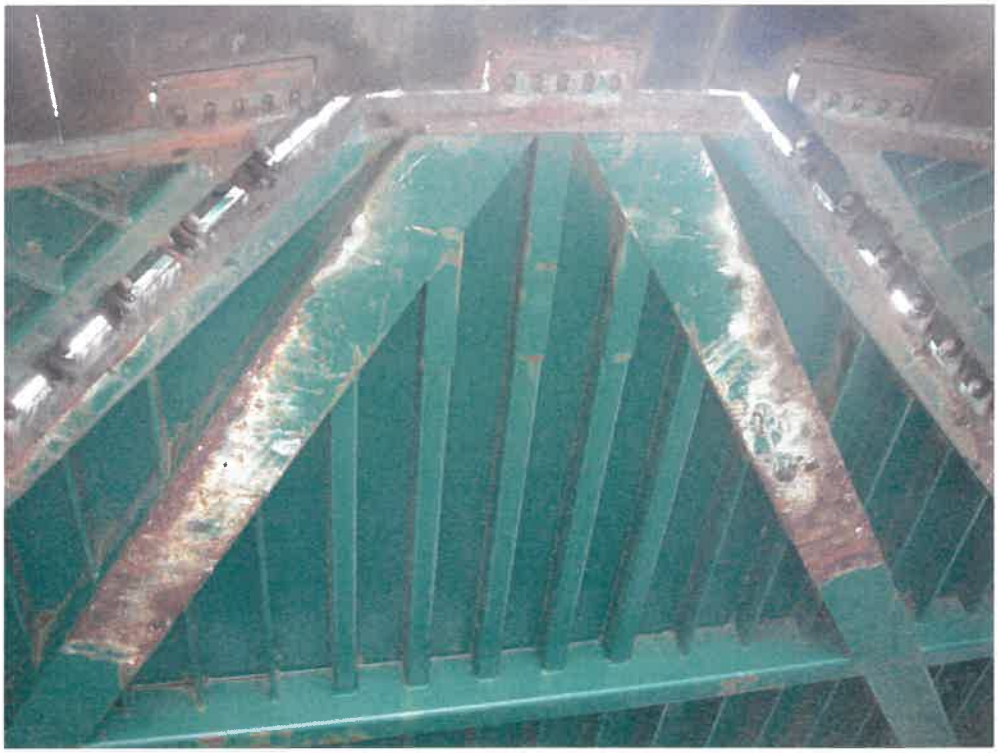
Photo Type: R - Repair

Orientation: Shore

Date: 9/12/2011

Repairs: 10018

Bottom of Apron is scraped and rusted from boat.



SI-118

8305 Apron Hinge Multi-Pin & Plate

Photo Type: R - Repair

Orientation: Shore

Date: 9/10/2019

Repairs: 10018

Apron pins have corrosion section loss to the hinge support plates.

Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

UW-7

8342 Live Load Hanger Bars (FC)

Photo Type: I - In Depth

Orientation: Right

Date: 10/11/2017

Repairs:

Both live load hangers have welded and intact angle stops. Right live load hanger shown looking right.

SI-106

8413 Steel Tower

Photo Type: G - General

Orientation: Sea

Date: 12/24/2013

Repairs:

Inboard end of repaired crack on horizontal member, left tower.

Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

UW-8

8451 Steel Pile Frame Wingwalls

Photo Type: G - General

Orientation: DN

Date: 10/11/2017

Repairs:

Random D-meter thickness readings were taken of wingwall piles.

UW-9

8451 Steel Pile Frame Wingwalls

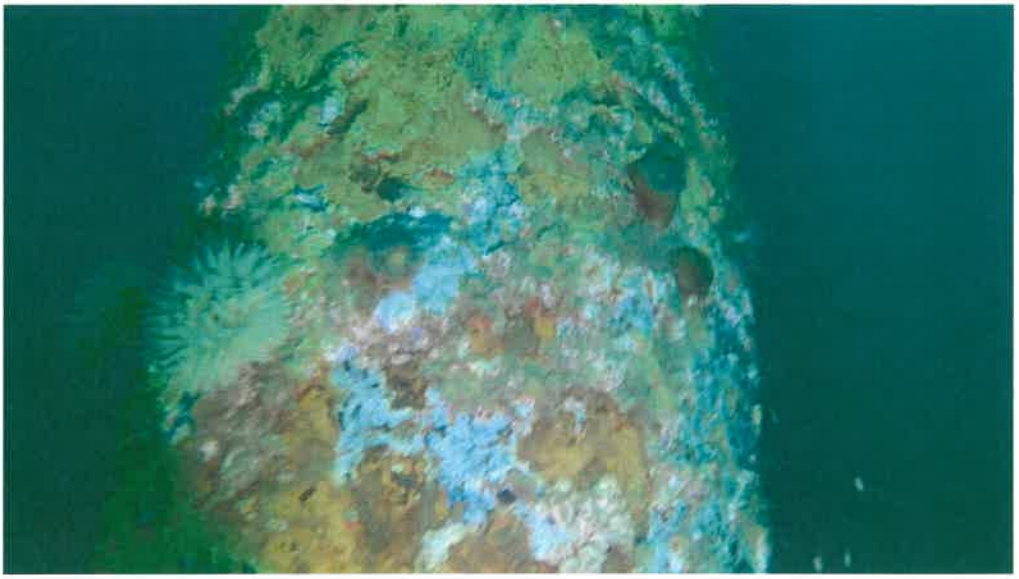
Photo Type: I - In Depth

Orientation: UP

Date: 10/11/2017

Repairs:

Left wingwall fender piles typically have pitting with section loss up to 20% from MDL up to MDL + 13'. LW Pile 1C shown.



Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

UW-10

8462 Steel Pile Frame Dolphins

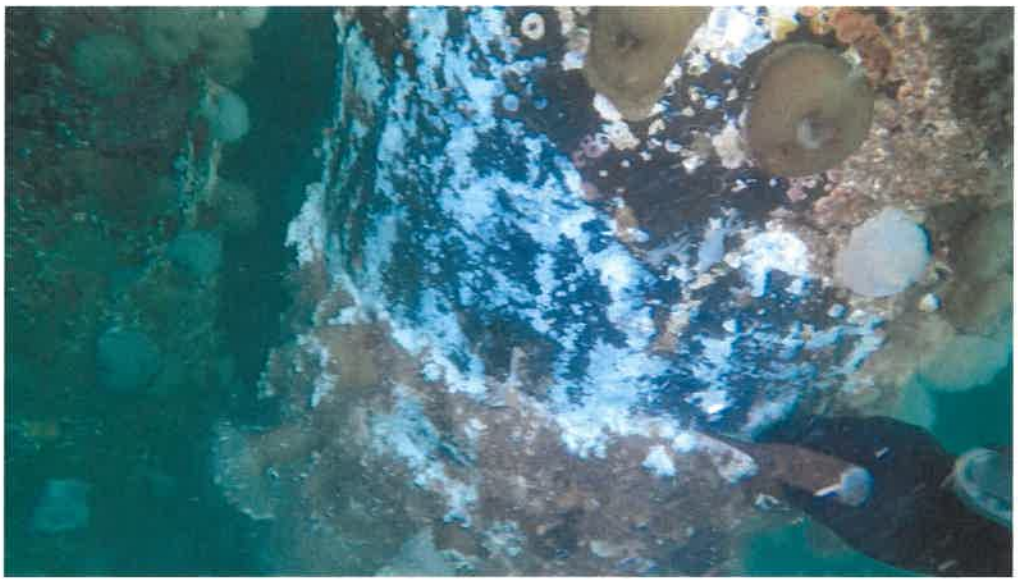
Photo Type: I - In Depth

Orientation: Sea

Date: 10/11/2017

Repairs:

Typical Level II cleaning on steel dolphin pile. RO Pile 2A shown looking offshore.



UW-11

8462 Steel Pile Frame Dolphins

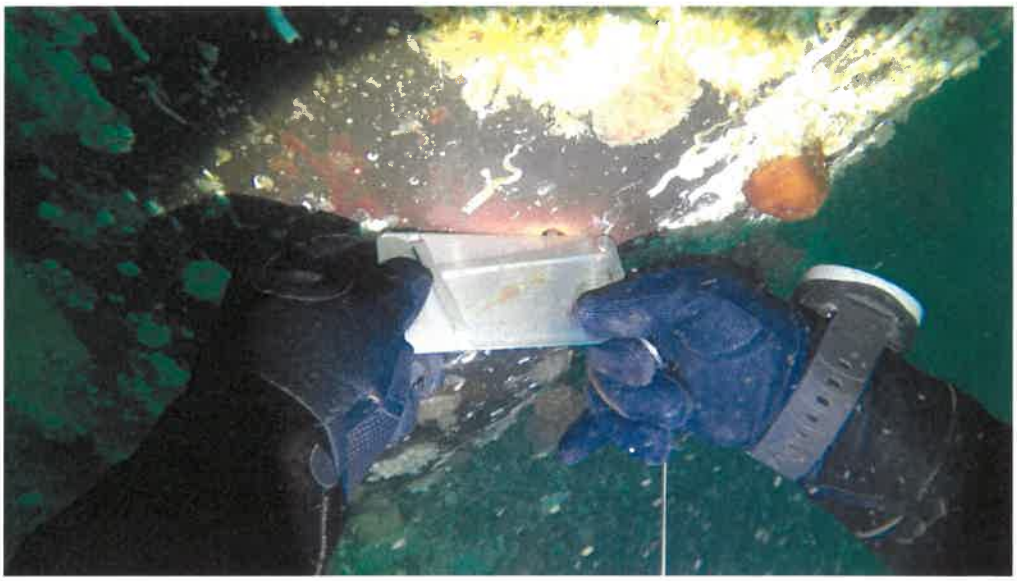
Photo Type: I - In Depth

Orientation: DN

Date: 10/11/2017

Repairs:

A pit guage was used to measure the depths of pits into the steel. RI Pile 1A is shown.



Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

UW-12

8462 Steel Pile Frame Dolphins

Photo Type: R - Repair

Orientation: Sea

Date: 10/11/2017

Repairs: 10019

The ladder sinker block is rubbing and hitting RO Pile 3A creating 2sf of coating failure. No section loss was found.

UW-13

8462 Steel Pile Frame Dolphins

Photo Type: R - Repair

Orientation: Sea

Date: 10/11/2017

Repairs: 10019

The ladder sinker block is rubbing and hitting RO Pile 2A creating 2sf of coating failure. No section loss was found.

Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

MI-17

8463 Timber Floating Dolphin

Photo Type: G - General

Orientation: Left

Date: 8/14/2002

Repairs:

Loose rubbing sheets on shore end of floating dolphin. Looking left and onshore.

MI-69

8463 Timber Floating Dolphin

Photo Type: R - Repair

Orientation: Right

Date: 7/12/2005

Repairs:

Red and yellow tagged bracing in the Slip 1 floating dolphin.

Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

UW-14

8463 Timber Floating Dolphin

Photo Type: R - Repair

Orientation: Right

Date: 10/11/2017

Repairs: 10020

The timber dolphin is listing where it's 1.5 ft. lower than the inshore left.

UW-15

8463 Timber Floating Dolphin

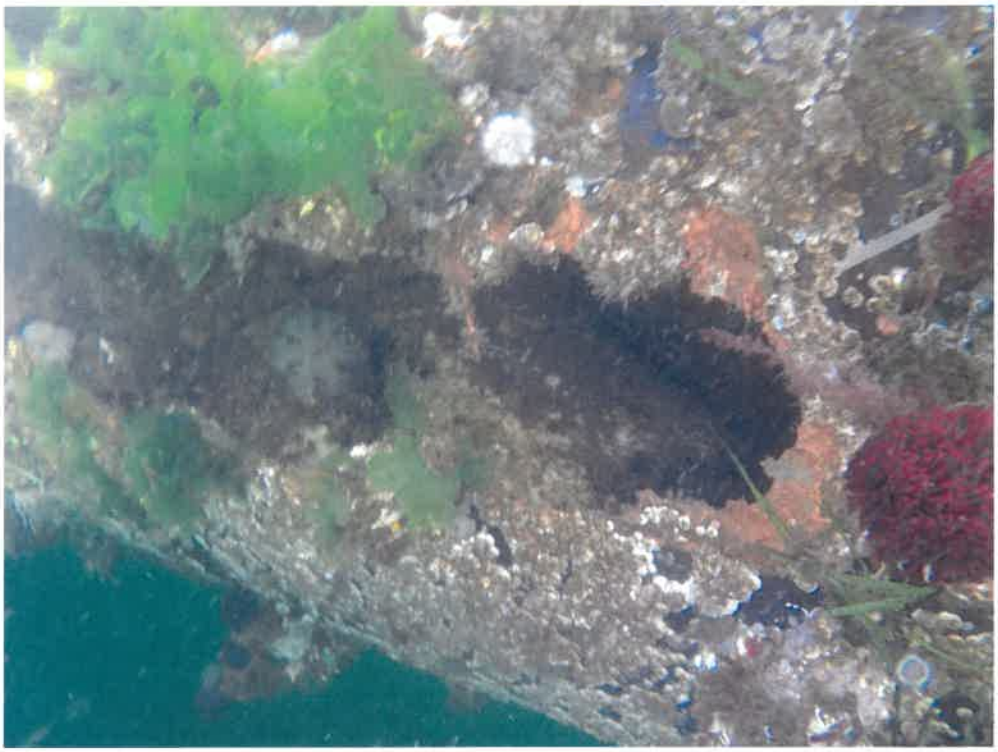
Photo Type: R - Repair

Orientation: UP

Date: 10/11/2017

Repairs: 10020

Timber dolphin steel pontoon large hole 3'(W) x 6'(L).



Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

UW-16

8463 Timber Floating Dolphin

Photo Type: R - Repair

Orientation: UP

Date: 10/11/2017

Repairs: 10020

Inside of one of the timber dolphin steel pontoon holes.

UW-17

8463 Timber Floating Dolphin

Photo Type: I - In Depth

Orientation: DN

Date: 10/11/2017

Repairs:

Both back chains have section loss up to 20%.

Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

UW-18

8463 Timber Floating Dolphin

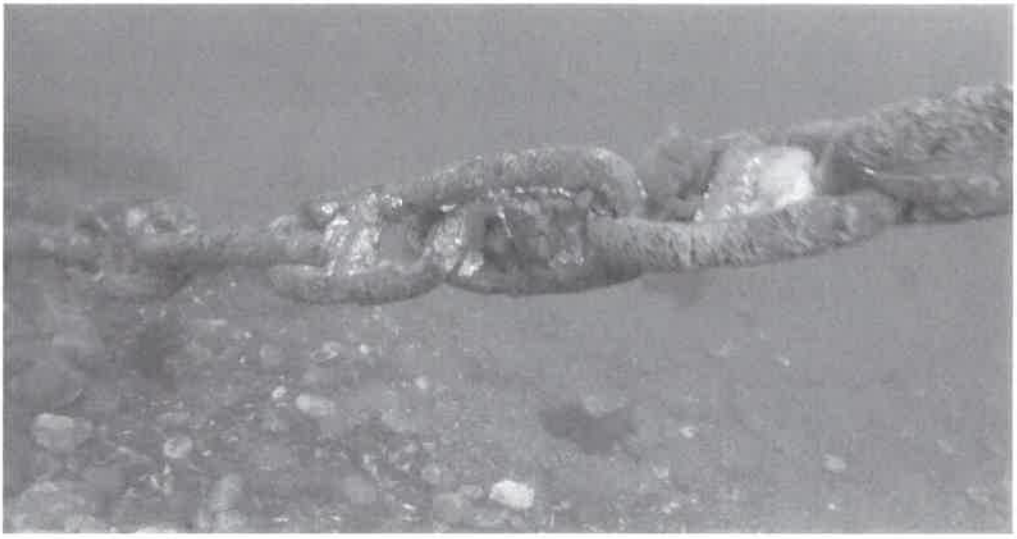
Photo Type: I - In Depth

Orientation: UP

Date: 10/11/2017

Repairs:

Quantity includes the bridge seat and each tower group. Color has been reduced for picture clarity.



UW-19

8463 Timber Floating Dolphin

Photo Type: R - Repair

Orientation: DN

Date: 10/11/2017

Repairs: 10021

Chain F3 has up to 75% of overall section loss and fretting in chain links directly below pontoon.

Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

UW-20

8463 Timber Floating Dolphin

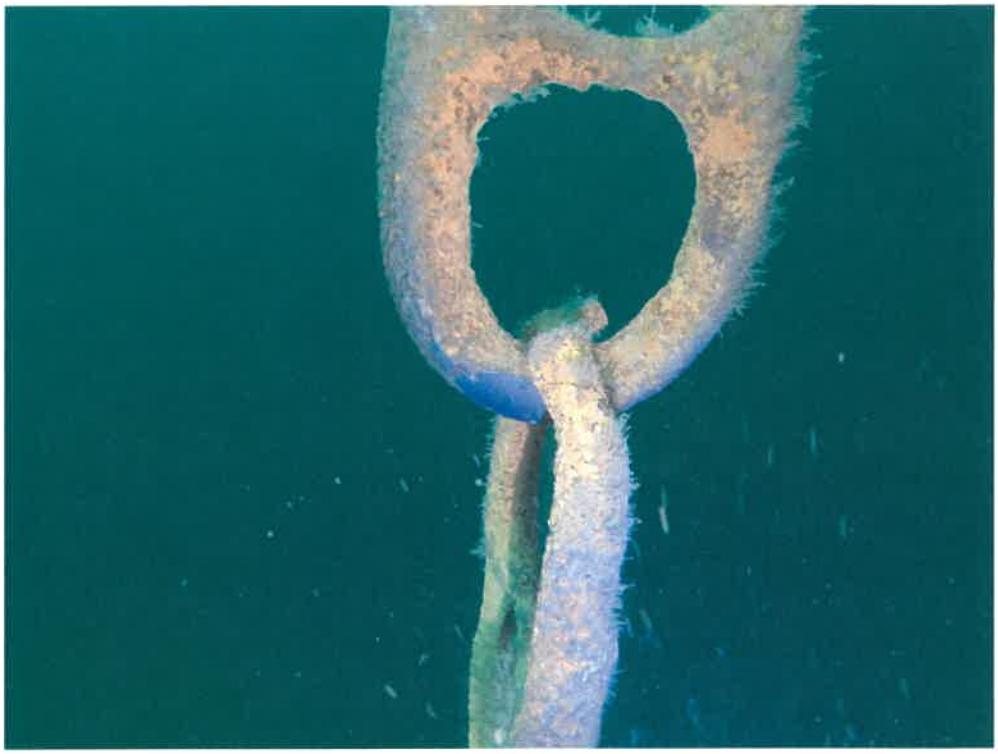
Photo Type: R - Repair

Orientation: UP

Date: 10/11/2017

Repairs: 10021

Chain F3 has up to 75% of overall section loss and fretting in links directly below pontoon



UW-21

8463 Timber Floating Dolphin

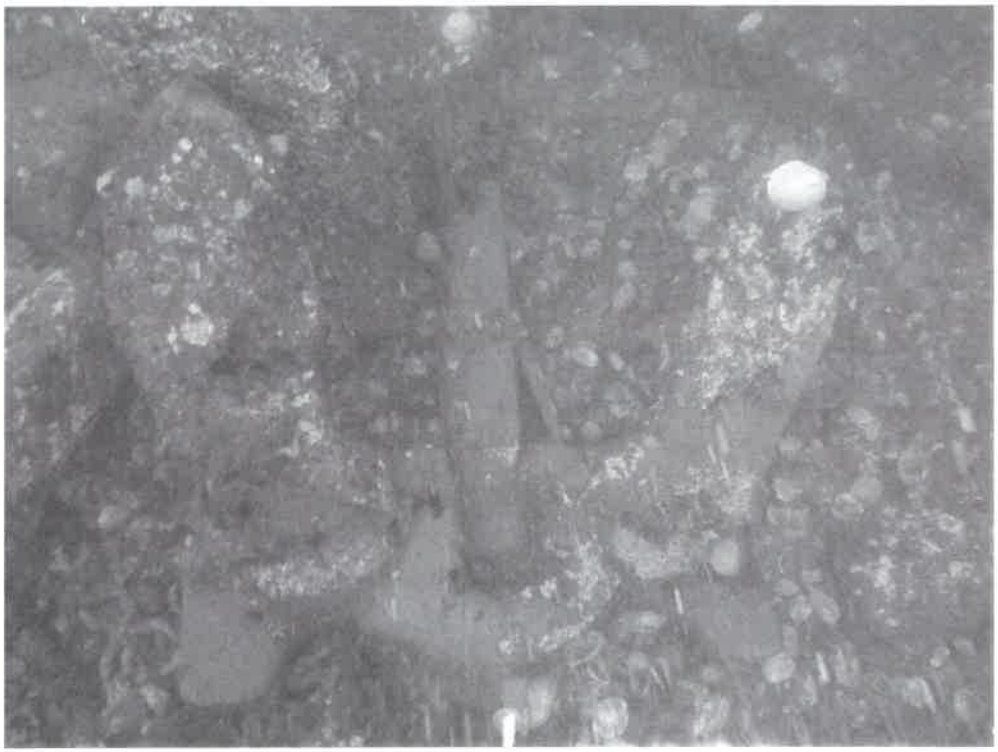
Photo Type: G - General

Orientation: DN

Date: 10/11/2017

Repairs:

The F3 anchor is laying at an acute angle offshore and back to the left against the chain instead of in-line with the chain. Note F3 chain upper right in photo. Color has been reduced for picture clarity.



Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

UW-22

8910 Safety Access Ladders

Photo Type: R - Repair

Orientation: Sea

Date: 10/11/2017

Repairs: 10022

Left inner dolphin has ladder with sinker block tied on right side to rungs by rope.

UW-23

8910 Safety Access Ladders

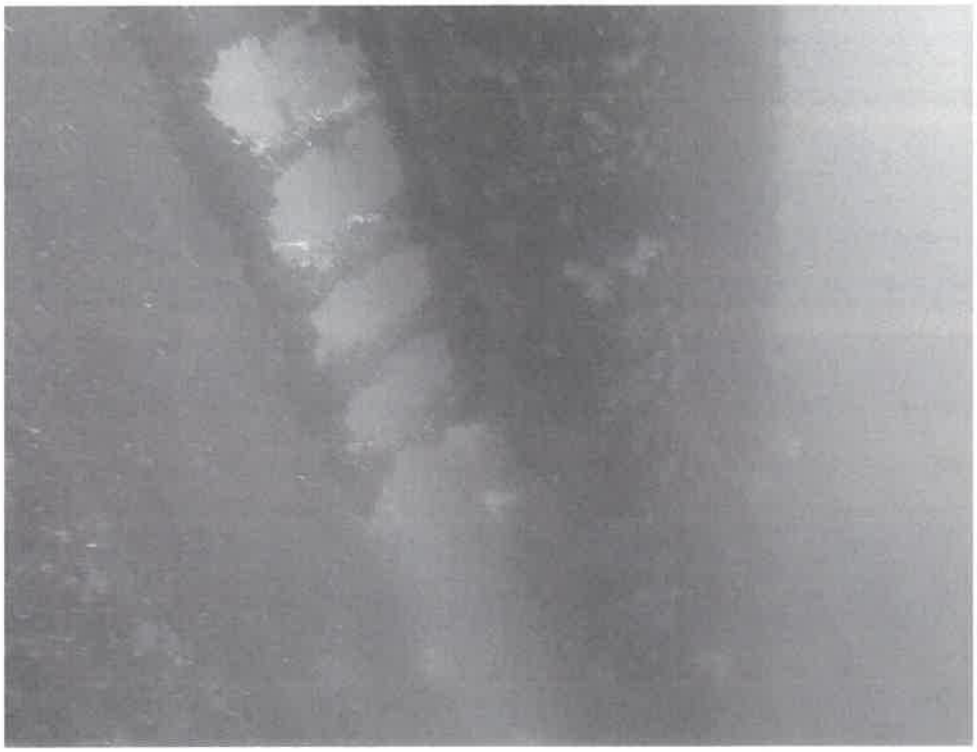
Photo Type: R - Repair

Orientation: DN

Date: 10/11/2017

Repairs: 10022

The LO dolphin ladder does not have a sinker block. Color has been reduced for picture clarity.



Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

UW-24

8910 Safety Access Ladders

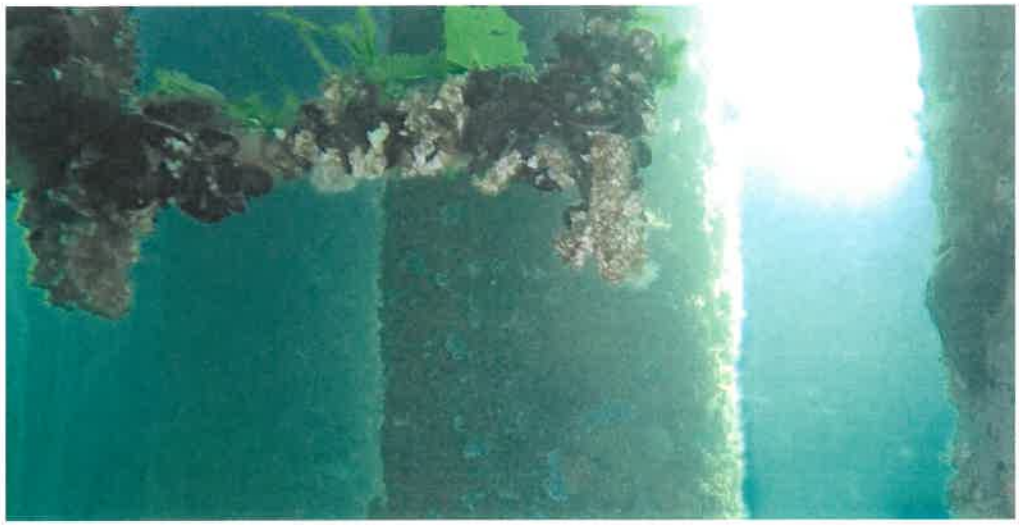
Photo Type: R - Repair

Orientation: UP

Date: 10/11/2017

Repairs: 10022

The LO dolphin ladder shows no attachments or holes for attachments.



Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

Entry Name	Folder Name	Type	Repairs	Page
SI-115	0 Orientation	D		1
SI-116	0 Orientation	E		1
UW-0	0 Orientation	W		2
SI-121	1 Fracture Critical Inspection Notes	G		2
SI-122	1 Fracture Critical Inspection Notes	R	10018	3
UW-1	1677 Channel Protection	G		3
UW-2	8125 Concrete Submerged Pile/Column	G		4
UW-3	8128 Steel Submerged Pile-	G		4
UW-4	8128 Steel Submerged Pile-	I		5
UW-5	8128 Steel Submerged Pile-	I		5
UW-6	8128 Steel Submerged Pile-	G		6
MI-58	8130 Steel Pier Cap-	S		6
SI-124	8130 Steel Pier Cap-	R	10018	7
MI-66	8201 Steel Open Girder, (FC)	G		7
SI-95	8201 Steel Open Girder, (FC)	R	10018	8
SI-120	8201 Steel Open Girder, (FC)	R	10018	8
SI-108	8206 Steel Floor Beam	R	10018	9
SI-114	8206 Steel Floor Beam	R	10000	9
SI-119	8206 Steel Floor Beam	R	10018, 10023	10
SI-109	8209 Steel Stringer	R	10018	10
SI-113	8224 Thin Polymer Overlay less Than 0.5 Thick-	G		11
SI-125	8225 Non-skid Metal Surfacing	G		11
SI-96	8301 Apron Steel Orthotropic Deck	R	10018	12
SI-118	8305 Apron Hinge Multi-Pin & Plate	R	10018	12
UW-7	8342 Live Load Hanger Bars (FC)	I		13
SI-106	8413 Steel Tower	G		13
UW-8	8451 Steel Pile Frame Wingwalls	G		14
UW-9	8451 Steel Pile Frame Wingwalls	I		14
UW-10	8462 Steel Pile Frame Dolphins	I		15
UW-11	8462 Steel Pile Frame Dolphins	I		15
UW-12	8462 Steel Pile Frame Dolphins	R	10019	16
UW-13	8462 Steel Pile Frame Dolphins	R	10019	16
MI-17	8463 Timber Floating Dolphin	G		17
MI-69	8463 Timber Floating Dolphin	R		17
UW-14	8463 Timber Floating Dolphin	R	10020	18
UW-15	8463 Timber Floating Dolphin	R	10020	18
UW-16	8463 Timber Floating Dolphin	R	10020	19
UW-17	8463 Timber Floating Dolphin	I		19
UW-18	8463 Timber Floating Dolphin	I		20
UW-19	8463 Timber Floating Dolphin	R	10021	20
UW-20	8463 Timber Floating Dolphin	R	10021	21
UW-21	8463 Timber Floating Dolphin	G		21
UW-22	8910 Safety Access Ladders	R	10022	22

Status: Released | Printed On: 11/14/2019 | Agency: State Ferries

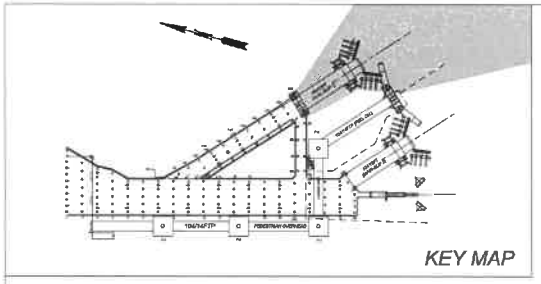
CD Guid: fb09554e-6714-4ced-9b6c-c5554787c3bf | Release Date: 11/13/2019 | Program Mgr: Evan M Grimm

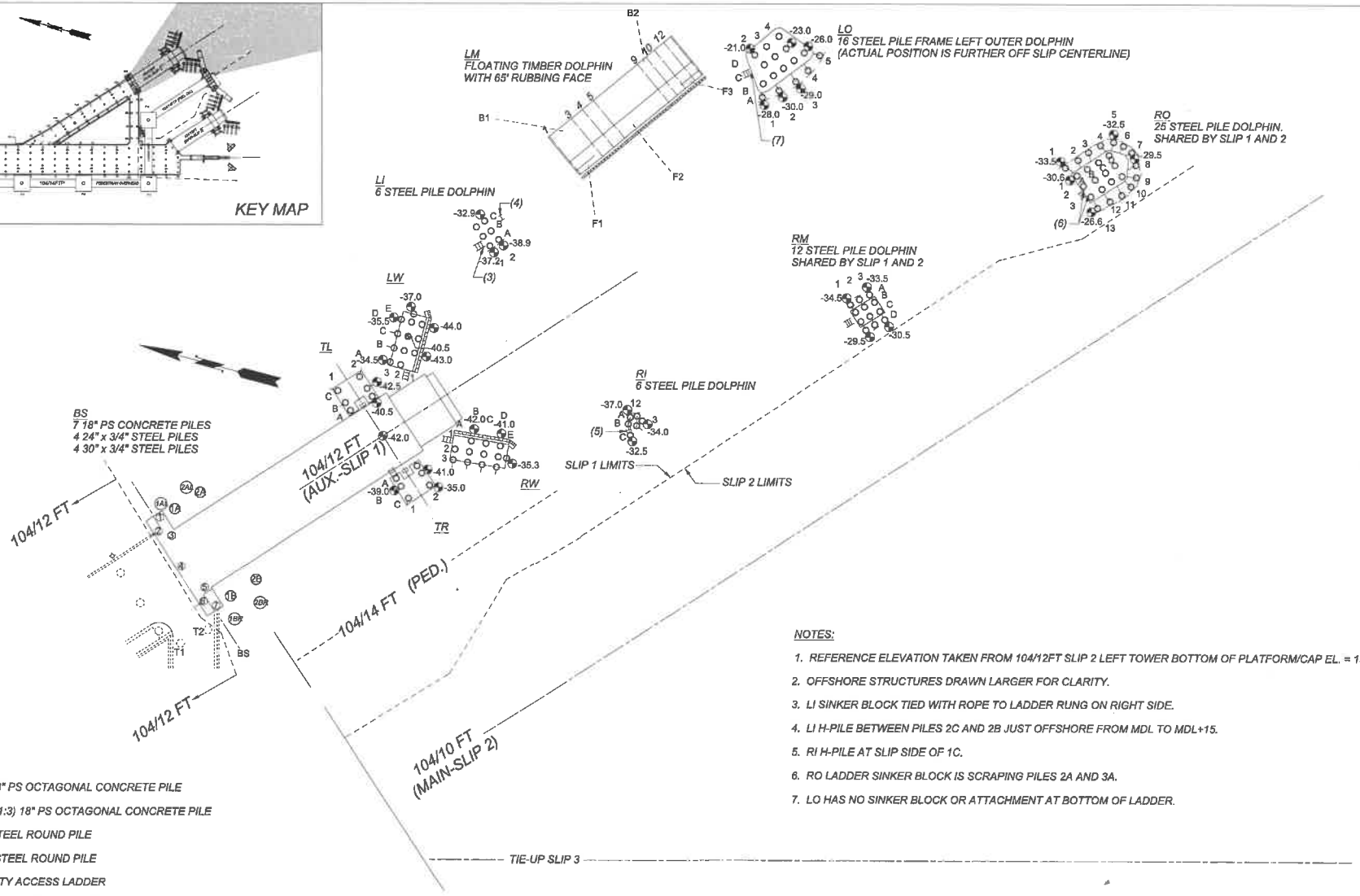
Br. No. 104/12FT **SID** 0016191A **Br. Name** KINGSTON (AUX.-SLIP 1)

Carrying SR 104 **Route On** 00104 **Mile Post** 24.44

Intersecting APPLE TREE COVE **Route Under** **Mile Post**

Entry Name	Folder Name	Type	Repairs	Page
UW-23	8910 Safety Access Ladders	R	10022	22
UW-24	8910 Safety Access Ladders	R	10022	23





NOTES:

1. REFERENCE ELEVATION TAKEN FROM 104/12FT SLIP 2 LEFT TOWER BOTTOM OF PLATFORM/CAP EL. = 19.0.
2. OFFSHORE STRUCTURES DRAWN LARGER FOR CLARITY.
3. LI SINKER BLOCK TIED WITH ROPE TO LADDER RUNG ON RIGHT SIDE.
4. LI H-PILE BETWEEN PILES 2C AND 2B JUST OFFSHORE FROM MDL TO MDL+15.
5. RI H-PILE AT SLIP SIDE OF 1C.
6. RO LADDER SINKER BLOCK IS SCRAPING PILES 2A AND 3A.
7. LO HAS NO SINKER BLOCK OR ATTACHMENT AT BOTTOM OF LADDER.

LEGEND:

- VERTICAL 18" PS OCTAGONAL CONCRETE PILE
- BATTERED (1:3) 18" PS OCTAGONAL CONCRETE PILE
- VERTICAL STEEL ROUND PILE
- BATTERED STEEL ROUND PILE
- STEEL SAFETY ACCESS LADDER
- 24" DIAM. DRILLED SHAFT SUPPORT FOR BRIDGE SEAT CATHCHER FRAME
- 30" DIAM. x 3/4" PILE FOR 2017 BRIDGE SEAT SCOUR REPAIR
- XX.X FIELD MEASURED GROUND ELEVATION
- LIVE LOAD HANGER AND STOP

ROUTINE INSPECTION	UNDERWATER INSPECTION
Date: SEPTEMBER 10, 2019	Date: OCTOBER 11, 2017
Scale: NA	Scale: NA
Inspected by: CRT/MDM	Inspected by: RMP/JRWH

WSDOT
BRIDGE PRESERVATION OFFICE

Washington State Department of Transportation
Bridge and Structures Office

104/12FT KINGSTON (AUX.-SLIP 1)
SID 0016191A

LAYOUT

SHEET NO. 1
SHEET 1 OF 1 SHEETS

W:\Data\Bridge\Special Structures\Ferry Terminals\2019\Kingston\12FT - Slip 1\Layout.dgn
10/22/2019 3:32:07 PM